

Design of the Nb₃Sn 13T Dipole D20, * D. DELLORCO R. SCANLAN, AND C. TAYLOR. Lawrence Berkeley Laboratory, Berkeley, CA 94720.--- A 50 mm bore superconducting Nb₃Sn dipole with a short sample field of 13 T at 4.3 K and a current of 5500 A/turn is studied. The inner cable has 37 strands with a strand diameter of 0.75mm and a Cu/Sc ratio of 0.4; the outer cable has 47 strands with diameter 0.48mm and a Cu/Sc ratio of 1.15. There are two inner layers and two outer layers. This magnet has a thin stainless steel collar and a "close in" elliptical iron yoke in order to obtain a high transfer function and low saturation effects on the multipoles. The thin collar itself provides only a minimum prestress and the full prestress is given by a thick aluminum ring and collet structure. Aluminum spacers are used as assembly tools and as means to control the gap size in the vertically split iron yoke. This paper presents the magnetic design and the calculated stress and strain distribution in structure and coils. A 1 mm model is to be built.

* This work was supported by the Director, Office of Energy Research, Office of High Energy and Nuclear Physics, High Energy Physics Division, U.S. Department of Energy, under Contract No. DE-AC03-76SF00098.

C3

Domenico Dell'Orco
MS 46-161
1 Cyclotron Road
Berkeley, CA 94720

Oral